# SCIENCE

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## *THE UNIVERSITIES OF AUSTRALIA AND NEW ZEALAND*[1]

### AUSTRALIA

I SHOULD not for a moment venture to make suggestions to the authorities of the university of which I am the guest were it not that these authorities have made a special request that I should give them an outline of my impressions. Each institution must work out its own destiny in its own way and as directed by its own environment. While each university must profit by the experience of others, as the universities of America have profited enormously by the experience of the universities of Germany, no university can use the methods of another unless these methods spring naturally, from likeness in conditions.

My direct knowledge of the University of Sydney is, as you know, slight. I have met some of its professors at different times and from these I have justly formed a high estimate of the character of the institution and of its work. For the rest, I have only the university Calendar and the impressions formed in a week of cordial hospitality.

The most important matter in a university is the character of its faculty. Next comes the degree of completeness of its

[1] In a course of lectures before the University of Sydney, President Jordan was asked to give a summary of his impression of the needs of the University of Sydney. A similar request was made at Wellington regarding the four colleges which constitute the University of New Zealand.

library and appliances, and lastly, the nature and adjustments of its courses of study and the fitness of the university's methods to the actual needs of the actual people which it serves. In these regards, considered as a whole, the University of Sydney must take a very high rank. In America it would take its position in the first rank or group of American universities. In organization, methods and work, it would stand nearest to the University of Pennsylvania, and its problems are much the same as those of that institution. The faculty, although smaller than in American institutions of like grade, is of a quality equal to that of the best institutions in any country, and in this consists the main excellence of a university anywhere.

If the University of Sydney were in America, it would open its doors more widely for the admission of students. It would not lower its entrance standards, but it would allow larger freedom in choice of subjects for admission, laying less special stress on Latin, or even on languages, if the student were well prepared in other subjects requiring an equivalent amount of work. It would lay no official stress on any particular subject, but would let each stand on its merits as determined by the judgment of the masters of its preparatory schools. The university would aid the secondary schools and widen its usefulness if it would examine the schools rather than the students at the time of matriculation. In other words, it would find out from friendly conference and careful inspection which of the secondary schools of Australia really and thoroughly met its requirements. It would then receive the pupils of these schools without further question.

The university should make it possible for the energetic and competent student to pay his way by work in vacation or otherwise, without outside help, through his university course. This would involve a material reduction in fees, and the difference should be made good by the state, in view of the great advantage which would accrue to it by the extension of the public school system to its crowning element, the university. In a frontier country, the intelligence and power of the new generation arises from the cabins of the pioneers rather than from the homes of those already well-to-do.

It is the experience of America that free scholarship won in competition by the very poor or the very bright does not meet the need of the state. It is morally better that all, rich and poor, should be treated alike. Moreover, the element of competition for prizes and favors is opposed to sound scholarship and to the pursuit of learning for its own sake.

In the course of study, some modification toward the group system or the elective system will be found to intensify the interest of students in their work. Interested students make good teachers. The results of placing all subjects and all chairs on an academic equality, putting aside set courses, and placing each student's course under the direction of his major professor, have been found excellent in America. It has led to a new birth of educational interest wherever it has been tried. If each professor has the educational direction of his own students, there is no occasion for the discussion of the relative values of students and studies, as between science, mathematics, history and the classics. Each student can select his own master among the university professors and each professor can carry out his own ideas of education. After all, it is the man who counts and not the subject. There is no value in subjects prescribed for mental broadening if these are taken unwillingly.

Unwilling work forms bad mental habits, degrades learning and paralyzes instruction. In these matters the student can be trusted to choose. Whatever his choice, he can not go far wrong, and the greater the responsibility thrown on him, the more certain he is to rise to it.

The examination does not play such an all-compelling part in Sydney as in Oxford and Cambridge. And yet I think too great stress is laid upon it. What we want is that the student should do his work honestly, thoroughly, and when it is due. That he should pass an elaborate examination is another matter. The power to pass examinations well is often a matter of quick memory rather than of sound understanding. Examinations are passed through mastery of text-books; to comprehend the subject is quite another matter.

To have examinations set by outside persons is to degrade the teacher to a mere coach. To make examination a chief function of a university is to substitute an incidental function of questionable value for the real purpose of the university. The standards set by the University of London, which is primarily an examining board, are very high, but it is an open question whether this university, as an examining university granting degrees, does now anything worth while for English scholarship. The real university is a teaching university. All forms of knowledge which can broaden the mental horizon, add to the rational pleasures of life, better human conduct or be wrought into rational and helpful action are within its province.

To meet this demand in full, the range of studies in the University of Sydney will need to be greatly widened and intensified as time goes on. The number of professors should be doubled, the chairs should be subdivided, the work should be carried farther, and "the hunger and thirst which only the student knows" should be satisfied in every possible way. This again means larger equipment, a larger library and a vastly increased range of scientific appliances.

To this end the state must have a higher appreciation of the university. It must treat it more liberally—not to be generous, but to be just, toward its own interest. The rich men of Australia should regard the university as their natural heirs, for in no way can money do more good than in increasing the energy, the intelligence, the self-devotion, the efficiency of the generations which follow. That the state will demand a larger share in the control of the university is another reason why the university should educate the state.

Another need of the University of Sydney, one which can not be so easily met, is that of generous competition. The friendly rivalry between neighboring universities strengthens both, the more so if they differ in organization and method. It leads the youth of promise to feel that his choice lies between university and university, not to the mere choice between the local university and none at all.

Since California came to have two universities close together, the number of college students in the state has risen from 450 to over 4,500. The pressure of higher education to the square inch is said to be higher in California than anywhere else in the world.

On each recurrent day of athletic rivalry, the whole population of the state is divided between the blue and gold of California and the cardinal red of Stanford. In a recent address in San Francisco, Professor Bacon, of the University of California, said that if the whole endowment of Stanford had been given to the older institution, it would have helped it

less than it has been aided by the friendly rivalry of the two.

And yet, when Stanford University opened in 1891, a prominent journal said that there was "about as much need of a new university in California as for an asylum for decayed sea captains in Switzerland." It is through variation in structure and through the natural selection of favorable variations that all progress arises, whether in the evolution of organisms or in the development of universities.

The history of every nation is first written in its universities, and in so far as the Australia of the future shall have a noble career, the elements of this career must be first recorded in Sydney, in Melbourne, in Adelaide, in the universities that are and are yet to be.

### NEW ZEALAND

In answer to a request for suggestions as to means of improving the teaching effectiveness of the colleges of New Zealand, I may be allowed to say:

1. Let examination be a function of the professor, not of the university. Each professor should certify to the college the work which the student has actually accomplished in satisfactory fashion.[2] Each college to certify to the university of New Zealand, through a vote of its professorial board, those students entitled to degrees.

2. Requirements of degrees should be stated in terms of work accomplished, not in terms of examinations required. The examination of any class should be controlled by its teacher.

3. The chairman of the professorial board should have as many as possible of the functions of the American university president. Especially he should have the initiative in academic matters, the choice of professors and the adjustment of courses. In this he should appear as representative of the professorial faculty, looking after their common interests and keeping in touch with them. He should frequently visit the universities of Europe and America, and in the work of teaching, should he retain his chair, he should be aided by a competent associate.

4. So far as possible, the certificate of masters of approved secondary schools should be received in place of matriculation examinations. In receiving students, a generous range of substitution of subjects should be allowed, and book-cramming, especially in science, should be discouraged.

5. In American experience, the best method of adjusting the course of study is through that form of the group system known as the "major professor" system.

In New Zealand this could be adjusted as follows:

(*a*) Each student on matriculation shall select his major work in some one of the recognized departments of the college, as classics, modern languages, English, philosophy, education, mathematics, history, economics, zoology, botany, geology, physics, chemistry, law, civil, electrical or mechanical engineering.

(*b*) The professor in charge of the department becomes the student's adviser, and his approval is necessary in all adjustments of studies at the beginning of each college term.

(*c*) Each of these departments will carry on such courses as the staff is able to

[2] At present, all papers representing final examinations in the four colleges composing the University of New Zealand (Otago College at Dunedin, Canterbury College at Christchurch, Victoria College at Wellington and University College at Auckland) are sent to London to be graded. To those successful in the final examinations in six subjects (representing about three years' work) degrees are granted by the University of New Zealand.

carry, the higher value of advanced over elementary work being kept in mind.

(*d*) To be eligible to the bachelor's degree a student must have completed the equivalent of three (preferably four) years of instruction in collegiate work. In this must be included the major work of some one department, with such minors as may be indicated by the head of such department, and also such electives as may be approved by the "major professor" at the time of registration.

(*e*) A student may change his "major department" on petition (and with the consent of the professors concerned). In this case the work done as major becomes a minor, and the back work of the new major must be made good.

(*f*) Departments should stand on a basis of academic equality, no student being obliged by the college to take one subject rather than another. Such prescription of studies should be the work of the major professor.

The colleges in New Zealand should devote themselves primarily to the actual needs of New Zealand. The professorship should carry greater power and greater responsibility than now, and much of the work of the council should be transferred to the four professorial boards.

6. Degrees should not be granted for extra-mural study, and in general not for attendance on night lectures or extension lectures.

To do work really worthy of university recognition, the student should enter the university atmosphere. He should make all possible use of teachers, laboratories and libraries.

7. Taxation of university students is the most oppressive form of state taxation.

8. In general, the professor as teacher has far too little initiative in the colleges of New Zealand. The students with their varied interests and varied talents should be the first consideration of the university. Honors may be granted on the judgment of the professorial body. It is impossible to arrange good students in linear series, as each one should be striving for a goal of his own.

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## *THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. SUMMER MEETING, SECTION E—GEOLOGY AND GEOGRAPHY*[1]

SECTION E of the American Association for the Advancement of Science held a summer field meeting at and near Plattsburg, N. Y., July 3–11, inclusive, to which all members of the Geological Society of America and the Association of American Geographers were invited. The number in attendance at the meeting was forty-four. The section was fortunate in having delightful weather for all of the excursions, there being no rain to interfere with the field trips until noon of the last day, when the party were assembled under the hospitable roof of Professor Kemp's house on Lake George.

The preliminary trip on July 3 was made to visit "The Gulf" at Covey hill. This drive of some thirty miles from Mooers, N. Y., across the Canadian boundary was exceedingly interesting to all students of glacial geography. The marine and glacial shorelines were visited on the route westward from Mooers, and the party stopped for lunch in "The Gulf," near the two lakes which show the location of the gorge that represents the ancestor of Niagara. The noon talk, given by J. B. Woodworth, who has worked out the glacial history of this region, was on

### ABANDONED SHORELINES

At "The Gulf" Professor Woodworth spoke in substance as follows: "The Gulf"

[1] Plattsburg, New York, July 3–11.